CORRES CONTROL OUTGOING LTR NO.		
DOE ORDER #		
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DIST.	LTR	ENC
[illegible], M. E.		
BENEDETTI, R. L.		
BENJAMIN, A.		
BERMAN, H. S.		
BRANCH, D. B.		
CARNIVAL, G. J.		
COPP, R. D.		
DAVIS, J. G.		
FERRERA, D. W.		
HANNI, B. J.		
HARMAN, L. K.		
HEALY, T. J.		
HEDAHL, T.		
HILBIG, J. G.		
HUTCHINS, N. M.	X	
KIRBY, W. A.		
KUESTER, A. W.		
MAHAFFEY, J. W.		
MANN, H. P.		
MARX, G. E.		
McDONALD, M. M.		
McKENNA, F. G.		
MONTROSE, J. K.		
MORGAN, R. V.		
POTTER, G. L.		
PIZZUTO, V. M.		
RISING, T. L.		
SANDLIN, N. B.		
SETLOCK, G. H.		
STEWART, D. L.		
SULLIVAN, M. T.		
SWANSON, E. R.		
WILKINSON, R. B.		
WILLIAMS, S. (ORC)		
WILSON, J. M.		
[illegible], R. B.		
Madel, R E	X	X
[illegible]	X	X
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[illegible]	X	X
CORRES CONTROL	X	X
ADMIN RECORD	X	X
PATS/T130G		
TRAFFIC		
CLASSIFICATION		
UCNI		
UNCLASSIFIED		
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE

DOCUMENT CLASSIFICATION

REVIEW WAIVER PER

CLASSIFICATION OFFICE

DATE

IN REPLY TO RFP CC NO:

ACTION ITEM STATUS

☐ PARTIAL/OPEN

☐ CLOSED

LTR APPROVALS:

ORIG & TYPIST INITIALS

REM/cet

EG&G ROCKY FLATS

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February 4, 1994

94-RF-01558

S. R. Grace
Environmental Restoration Division
DOE/RFO

MINUTES FROM THE DECEMBER 2, 1993 MEETING ON SIX-PHASE HEATING TECHNOLOGY - JKH-016-94

EG&G Rocky Flats, Inc. is transmitting copies of minutes from a meeting on six-phase heating technology held December 2, 1993 with representatives from the Environmental Protection Agency, Colorado Department of Health, Department of Energy/Rocky Flats Office, Pacific National Labs and EG&G. The meeting was held to discuss the location of Test Site 2 under the current Operable Unit No. 2 Subsurface Interim Measure/Interim Remedial Action Soil Vapor Extraction program. EG&G requested the flexibility to move the location of Test Site 2 to a location within Operable Unit 1.

If you have any questions regarding the minutes, please contact R. E. Madel of Environmental Engineering & Technology on extension 6972.

J. K. Hopkins
Manager, Remediation Technology
Environmental Engineering & Technology

REM:cet

Orig. and 1 cc - S. R. Grace

Attachment:
As Stated

cc:

J. Pepe	-	DOE/RFO
R. J. Schassburger	-	DOE/RFO
E. A. Dillé	-	Aguirre
M. J. Harris	-	NFT

SIX-PHASE HEATING TECHNOLOGY
MEETING MINUTES
DECEMBER 2, 1993

Attenders:

NAME	ORGANIZATION	PHONE NUMBER
Robin Madel	EG&G Rocky Flats	966-6972
Annette Primrose	EG&G Rocky Flats	966-8618
Pete Laurin	EG&G Rocky Flats	966-8702
Eric Dillé	Aguirre Eng./DOE, RFO	966-4651
Todd Trangmar	EG&G Rocky Flats	966-3855
R. Zeke Houk	EG&G Rocky Flats	966-8714
Bill Fraser	EPA	294-1081
Gary Kleeman	EPA	294-1071
Theresa Bergsman	PNL	(509) 376-3638
Marcia Walter	PNL	(509) 372-3348
Jeff Swanson	CDH	692-3416
Michael D. Klein	EG&G Rocky Flats	966-6950
Scott Grace	DOE/ERD	966-7199
Tom Greengard	SMS/RFO	966-3677
Michael Harris	NFT/DOE	966-4189
Steve Stein	PNL/OTD	(206) 528-3340

Summary of Meeting

This meeting was held to discuss the possibility of moving the location of test site No. 2 under the existing Operable Unit No. 2 (OU 2) Subsurface Interim Measure/Interim Remedial Action IM/IRA program to a location within OU 1, specifically Individual Hazardous Substance Site (IHSS) 119.1. There is some preliminary evidence to suggest the presence of Non-Aqueous Phase Liquid (NAPL) contamination at IHSS 119.1. EG&G and DOE asked EPA and CDH for the flexibility to move to the OU 1 location if it were determined that the location is adequately contaminated.

OU 1 – NAPL Contamination

There is evidence in the groundwater for NAPLs. A soil vapor survey (SVS)over the southwest corner of IHSS 119.1 would provide an evaluation to see if this is present (third week of December).

OU 2 – Current SVE

Test Site 1 for the current SVE program starts February 1994. Potential start for Six-Phase Heating (at Test Site 2) is October.

More data is needed to characterize the site.

- SVS in IHSS 119.1 3rd week of December
- Split spoon samples, if necessary
- Phase II RFI/RI data-indicates presence of NAPLs
- Installation of extraction and injection wells will give additional data

Location Selection

Does OU 1 really have contamination, enough to make this a test? Is the contamination localized enough to make this an effective removal? Requirements for effective 6-Phase Heating:

- 40 x 20 area maximum for Six-Phase
- Adequate contaminants and concentrations

EG&G and PNL need to establish effectiveness criteria.

If OU 1 does not meet the effectiveness criteria, move to a site in OU 2 as originally planned.

The question is can the OU 1 location be used in place of the OU 2 location for test 2?

Kleeman: Why do Six-Phase Heating?

Klein: Heating was an option for Test 2 at OU 2. Six-Phase Heating is available to us through PNL with EM-50 funding. If there is an adequate area to be cleaned up at OU 1 it can be cleaned up first.

Fraser: What would we gain? The OU 1 cleanup is not part of OU 2 IM/IRA. Perhaps it is a good idea. What specific things would be learned in the IM/IRA?

Klein: The IRAP calls for the location of test site 2 to be at the Mound or 903 Pad.

Bergsman: The OU 1 data would be applicable to OU 2.

Houk: What could be learned from doing the test at IHSS 119.1?

Klein: This info will help assess whether this is a cost effective method as well as operating parameters.

Fraser: The three sites at OU 2 were different situations.

Grace: Maybe this should be a time out from the OU 2 schedule.

Fraser: Will this really be effective?

Klein: It will add to knowledge gained. We could stay at the current location, add additional staff at OU 2 and do the subsurface heating here. Or we could make this the removal action.

Swanson: Will the PVC in the wells melt?

Bergsman/Klein: No. We can always sink new wells.

Fraser: We have two goals in the IRAP– To learn things about SVE in different environments, and to take advantage of the opportunity if the SVE works well and use it to clean up the site. If either site presents a better opportunity, then use it.

Kleeman: An adequate characterization should be performed to determine where the technology fits best.

Fraser: Test Plan 2 will have to be modified.

Madel: We need better data to ensure that the OU 1 site is appropriate. We need more characterization. Then we'll have another meeting to discuss our recommendations.

Klein: More SVS data has been collected for OU 2 already. The new data will be evaluated to see if the concentrations are high enough. We need a consensus before pursuing either site.

Madel: The data will be available in January. Then we'll meet.

Fraser: How does this relate to the Early Action?

Klein: There are two methods we can pursue– an Emergency Removal and an EE/CA .

Fraser: There is a new OSWER directive on SVE, Thermal Desorption, and Incineration for VOCs in soil.

Klein: We would like to use Six-Phase for OU 2 IHSS 110 but we need to characterize it further.

Dille': How will the OU 2 examination impact the milestone date. The EA and IM/IRAP are linked.

Grace: Six weeks after end of Test 1 is next Test 2 milestone.

Klein: June 24, 1994 Test 2 delivery date.

Grace: The location is up in the air. We need to gather data to determine where project is going.

Madel: We'll characterize OU 1 more and prepare a presentation comparing the OU 1 site to an OU 2 site.

Kleeman: Do you have more samples planned beyond the SVS.

Madel/Klein: That depends on what SVS shows.

Madel: A generator will be needed to generate a lot of power. We'll need an APEN.

Dille': Permanent power may be in by March, 1994.

Swanson: I'll check to see if this will be a problem. Robin please call to get the answer.

Madel: We need to add potable water to the heating elements.

Bergsman: We'll be adding 1 to 2 gallons/hour at the electrodes.

Swanson: Just like Iggy Liator.

Fraser: This information must be in the workplan. You have to show how this is not transporting contamination further.

Swanson: I'll check to see if you'll need a permit to put the water into the ground.

Fraser: Isn't this covered under the CERCLA permit?

Bergsman: It was a problem for us at Savannah River.

Steve Stein, OTD Coordinator

Implementing arm of DOE
Coordinates Demos
Senior manager at PNL

Bergsman: Heating will remove VOCs. Works when there is permeable soil, VOC and amounts that can be removed in a reasonable time frame. Problems at RFP – low soil conductivity, and high levels of contamination. Heating – Increases vapor pressure, in-situ steam (steam stripping), and tight soils heated from steam. More rapid removal of subsurface soil contamination.

Kleeman: Have you seen any success at Savannah River?

Bergsman: Post SVE testing of soils will be done next week. There was an increase of 200 PPB over baseline (non heated), however, those results were biased by a higher contaminated region outside of heating pattern area. This is contributing contamination and masking heating effect. We'll be doing post test SVS. We'll take core data at location after where core samples taken before (pre-test).

Steve Stein

Wants to get things done and get benefits from site cleanup. Convinced that everyone will come out ahead. Demonstrate that the technology:

- Makes sense
- Can clean up a site
- Gets more data at different sites

Wants more:

- Opportunity to be team players
- Move quickly, eliminate paperwork, blow through restrictions
- Scott is prepared to rid system of nonsense
- we've had success at other sites